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of this Gulf Coast. I did not note it outside the limits of the salt marshes. It nests close to water, in fact four out of six nests found were on small islands and within twenty-five feet of water. Mr. Kirn found a nest with a full set of three eggs on one of these mud shoals. The nests are different from those of most of the United States horned larks in that feathers are used for lining. In the Canadian forms I believe feathers are usually included, due no doubt to general practice among birds there to circumvent the cold weather. This Texan bird uses the water-washed feathers of small sandpipers and the like, and this practice seems to me to be more instinctive than practical. It is like the use of snake skins in nests of the Crested Flycatcher. The main part of the horned lark nests consisted entirely of a fine ribbon-like sea grass which was washed up in great profusion on the beach. The grass was, of course, bleached until nearly white.

During both our visits in May we did not note any signs of coyotes. This seemed very strange to me, because the animal is really numerous everywhere on the mainland and was seen daily. It would be an easy swim to the islands, and with a great reward at the end. Rapacious birds are almost entirely absent from that region and there are no rodents on the islands. It thus looks as though (aside from minor depredations by visiting oologists, perhaps every ten years) the terns have established themselves in a very well protected breeding ground. Mr. Camp writes me that steps will be taken to officially protect the colony, in addition to the natural protection already existing.

Tulsa, Oklahoma, January 25, 1922.

#### NOTES ON FOX SPARROWS IN CALIFORNIA IN THE AUTUMN OF 1921

By JOSEPH MAILLIARD\*

THE fall field work for 1921 in the Department of Ornithology of the California Academy of Sciences was so planned as to include further observations upon the fox sparrow group during the southerly flight from the threatening grasp of the northern winter.

As the autumn field work for the two previous seasons, carried on in the area covered by the Inner Coast Range (*Condor*, xxiii, 1921, p. 178), showed results that were practically similar insofar as concerned the species noted, the scene of activity for the fall of 1921 was shifted to the adjacent coast itself, that is to say, the northwest coast of California. This territory was selected principally, however, because it made possible the combination of fox sparrow work with another scheme which was in reality the main object of the expedition, the results of which will appear later in a separate paper.

It has been discovered that the subspecies of fox sparrow (*Passerella iliaca*) wintering along the coast of California in what is known as the "Humid Coast Belt" differ to a greater or less extent from those found a little farther inland at the same latitudes, but there are no published records of investigations of the conditions existing in the former territory during the migration

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period of early autumn. Hence it seemed advisable to get some idea of what was taking place there at this season of the year. While the other, and main, object of the fall work would interfere with our settling down in any one spot to keep daily watch, the combination of the two schemes seemed most advisable and worked out fairly well.

For this work Mr. Chester C. Lamb, an old member of the Cooper Ornithological Club, desired to accompany me, and he was taken on as temporary assistant, his car of an exceedingly well-known, if often caricatured, make being our means of transportation. Sometimes it transported and sometimes it didn't.

The most northerly objective point was Requa, Del Norte County, California, which was reached on September 15. A stay was made here until September 21, but, much to my surprise, no fox sparrows were seen. I had confidently expected to find the Townsend and Sooty Fox Sparrow scratching away at the edge of the woods or under thick brush, but, although our camp was on the verge of a magnificent redwood forest and near some very good brush cover for this genus, none was discovered.

When we left Requa on the latter date, a sharp watch was kept along the road for sparrows, with the idea that we might camp at any spot where some were met with; but not one was identified as we slowly drove along, although we passed through miles of very good cover, especially near what is known as Big Lagoon, between Trinidad and Orick, Humboldt County.

Having no encouragement to stop on the way, we went on to Eureka to consult with Mr. C. I. Clay, another Cooper Club member, who has been travelling over the roads of Humboldt County for enough years to know every foot of the country where any roads exist. My intention had been to make for the ridges in the vicinity of Bridgeville, on the road from Fortuna to the Sacramento Valley, but Clay thought that this would take us too far inland for our purpose before striking good fox sparrow country; so, instead of following the Van Duzen River to Bridgeville, I decided to go to Kneeland Prairie, about fifteen miles southeasterly from Eureka, actual distance, but some twenty-four miles by winding road. On September 22, we went into camp at the extreme easterly end of this "prairie" (all open rolling land, whether at sea level or on top of a mountain is called a "prairie" on the northwest coast), at an elevation of about two thousand feet on the edge of timber and brush land, some four miles south of the Kneeland post office and facing Taqua Butte. The narrow mountain ranges all through this part of the country have a northwesterly-southeasterly trend, with small rivers lying between them. Hence any birds migrating directly north or south must necessarily cross diagonally over these ranges; or else those following the ranges or valleys between would be diverted into the interior of the state if moving south, or out into the ocean if moving north.

Our camping place was chosen on account of its being where three ravines headed, one running up from the Mad River Valley and two from a small creek flowing into the Eel River system, as well as on account of its being near the lowest saddle in the range for a long distance, consequently the most likely place for birds to cross over from one valley to the other. There was good cover for fox sparrows in this vicinity, although possibly not the most attractive food.

We found these birds very scarce at first, in fact finding none at all on top of the ridges during the first few days of our stay, most of those noted being in the canyons on the Mad River side in partially brushy, cut-over timber. Here we found some signs of scratching along an old wood road. Lamb saw several fox sparrows pretty well down this canyon on the morning of September 23, and of these he obtained one specimen.

The next morning I went down this same canyon along the old wood road and saw five fox sparrows, securing two specimens; but they certainly were not present in any number. Those noted were in a mixed sort of brush consisting of second-growth tan-bark sprouts, mountain mahogany, spiraea, California bay trees, and madrone, with a little wild lilac scattered through it. Lamb found a few of the sparrows down another and lower ridge, scattered along, but there was not much activity in evidence. The 25th was too rainy for us to go into the brush, but on the 26th Lamb ran into quite a number on this same ridge, evidently part of a considerable movement working along singly or in small groups. I tried watching a trail in the brush near the top of this ridge where there seemed to be a likely place, but was rewarded by the sight of only one fox sparrow, the flight evidently passing below me toward the saddle referred to previously.

We stayed at this camp until September 30, noting a few of the sparrows every day but not in any numbers, and concluded that it was getting rather late, judging from former experiences in this line, for any large migrating movement. On this date we moved over to Capetown, near the mouth of the Bear River, about twenty-five miles southwest of Eureka, passing a couple of days encamped in the bed of the river about half a mile from the ocean.

A very steep hillside opposite us was covered with a dense growth of hazel and salmon-berry bushes in which a considerable number of fox sparrows were happily and safely—safely as far as hawks were concerned, at least—ensconced. It was very difficult to do much in this dense brush and, to add to this, the fog and wind threatened to make it still harder to carry on observations here, so we broke camp and moved farther inland to obtain shelter from some protecting ridge interposing between ourselves and the sea.

On October 2 we moved about fifteen miles (by line) farther south to an attractive spot on the Mattole River, five miles south of Petrolia (Humboldt County), and tarried there to see what we might find. Here again we found fox sparrows enjoying themselves in suitable spots, and of the same subspecies as hitherto noted. Proper food and cover were present and a limited number of specimens was taken. As before remarked, fox sparrows were not the only object of this field work and in fact were secondary, but a good deal of time was devoted to observing them and to getting sufficient specimens for identification, although the primary object interfered with our remaining long enough in any one place to exhaust fox sparrow possibilities.

While we were in Eureka, Clav had told us of a large thorn-covered area near Shelter Cove on the coast, and from his description of it I became anxious to reach this country to see what might be going on there, and concluded to make it our immediate objective while the weather held good. Inquiries along the road elicited the information that there was an old unoccupied cabin in a clearing near the bridge over the Mattole River on the road running from Briceland to Shelter Cove that would do for shelter in case of a storm, and

this we found without difficulty. This cabin was about two miles northwest of what is down on the current maps as Thorn, near the southern boundary of Humboldt County, but which is only a ranch where the Thorn post-office was maintained for a while. The latter has been moved recently to another ranch nearer Shelter Cove.

A large area in the vicinity of our camp was covered with a thick growth of the white thorn, which we found to be a sort of "buck brush" (*Ceanothus incanus*), interspersed in places with "wild coffee" (*Rhamnus californicus*), and "wild lilac" (*Ceanothus thyrsiflorus*). Thorn is only three or four miles from the south boundary of Humboldt County and at this camp we were only six or seven miles from the ocean, but separated from it by quite a high ridge which must cut off a good deal of the usual ocean breeze and accompanying fog, to judge from the appearance of the vegetation. It certainly affected the climate, for we had nipping frost in the morning and high temperature in the afternoon, which is unusual so near to the ocean at this time of year. We made this camp on the afternoon of October 4, in time to get settled and to look around a little before the early dusk of the autumn day.

Before sunrise the next morning we were out looking for fox sparrows and we assuredly found them. There were not so many in the flat surrounding the cabin, although they were fairly numerous even there; but in a narrow canyon near-by there were more individuals than I had ever seen in one place anywhere. In fact, I saw more in the two mornings here than in all my life before and yet I have been making a "hobby" of chasing around after this particular genus for a good many years past.

On the morning of October 5, Lamb was directed to work down the Mattole River to look especially for certain birds in that direction, while I went into the thorn brush to observe the fox sparrows. It turned out, however, that Lamb came across so many small birds in the brush on his way to the river that he did not get any farther, but remained also to note fox sparrows.

For my part I found the thorn brush, especially where the berry or seed bearing bushes were more numerous, swarming with birds of several species, which need not be mentioned here, but among which fox sparrows were largely represented. These latter would come to a squeaking sound (made by myself) from all directions and were remarkably tame. Ordinarily the individuals of this genus are extremely wary, usually alert to dive into the shelter of a bush at the slightest sound or movement on the part of an observer, but here they would come right out on dead branches to within four or five feet of one and look him right in the eye! Even such motion as changing one's position or quietly raising a hand did not seem to startle them.

There were a great many dead limbs among the living brush, as the country appeared to have been burnt over frequently, in all probability to make browse for the goats which are kept there. In spots where the fox sparrows were most numerous it was not unusual to see from half a dozen to twenty-five or thirty of them among the dead branches of a good sized bush after their curiosity had been excited by a succession of "squeaks" on my part.

Although Lamb came across a good many of these birds in the direction in which he went he did not find them so numerous in any one spot as had been my experience in the canyon spoken of above. While there was considerable frost in the early morning at this place the afternoons were actually

hot, and the birds not much in evidence at that period of the day, although Lamb found a spot near the river late one afternoon that had quite a number moving around or feeding in it.

Whether the sparrows we saw on the 4th and 5th of October were migrating or not we could not at first determine, but there did not seem to be anything about their actions that would lead one to conclude that such was the case. In order to determine this better I went on the morning of October 6 to the narrow canyon where the fox sparrows had been so numerous on the preceding day. If none was there the conclusion that they were migrating would naturally be reached. A few "squeaks" from me, however, filled the surrounding bushes with an excited lot of birds eager to find out the cause for this unwonted noise. With a little lining up, from a couple to half a dozen individuals might have been secured at a single shot with my 20-gauge gun, could one have backed far enough away to avoid blowing them to pieces.

In order to see whether the fox sparrows were mostly congregated in this canyon a tour was made, where cattle or goat trails permitted, through the brush on a hillside covering an area of something like half a mile square, and it was found that these sparrows could be "squeaked up" anywhere in this territory, from one or two up to six or eight appearing every time such a trial was made. If a similar condition exists over all the territory covered by the thorn bush in this locality, these birds must have been here in thousands.

Later that morning I went down the river canyon and found fox sparrows scattered all along wherever suitable places occurred. At the same time Lamb went into the brush on another hillside across the river and reported similar conditions there, with "half a dozen fox sparrows around me all the time", as he expressed it. As the large majority of these birds were of the same subspecies not very many were taken, our efforts being principally confined to observation and to securing any individuals that appeared darker or lighter than the others. The thorn bush here bears quantities of small, round seeds about the size of, and somewhat resembling, the hemp seed used as a food for canary birds, and this food appeared to be what attracted such numbers of the sparrows to this locality.

While it would have been advisable to remain here for some time in order to learn more of what the fox sparrows might do, there were weightier reasons for our leaving it, which we did, much to my regret, on the morning of October 7. The only other stop on the way back to San Francisco was made on Rattlesnake Creek, near Cummings P. O., Mendocino County, California, a locality best known today by the presence in the vicinity of an inn, much frequented by automobilists, known as "Twin Rocks Hotel". Our means of transportation acted exceedingly mean and finally ceased to transport, so that here we were laid up for several days for necessary repairs. Although there was a good deal of brush on the hillsides in places and up some of the canyons, we failed to find any traces whatever of fox sparrows in this vicinity and our observations upon that genus were abruptly ended.

No matter at which camp fox sparrows were secured during this trip, they are apparently nearly all of one subspecies. They appear to be practically of the same form as the darkest colored individuals we had taken during the field work of the two previous autumns and which I have placed as the Sooty Fox Sparrow (*Passerella iliaca fuliginosa*), although but few are typical.

Many of the balance apparently show intergradation with other races and are very difficult to place. Swarth, in his "Revision of the Avian Genus *Passerella*" (Univ. Calif. Publ. Zool., vol. 21, 1920, p. 150), says of a number of *P. i. fuliginosa* he had examined: "With the exception of one or two specimens from Humboldt Bay they do not even approach typical *fuliginosa* very closely in appearance; they are placed in that category because their characters are such as to indicate a closer affinity to *fuliginosa* than to any other form, and probably illustrate intergradation between *fuliginosa* and some one of the adjacent subspecies."

In the work just quoted (p. 144) Swarth states that the Townsend Fox Sparrow (*P. i. townsendi*) is abundant near Humboldt Bay (California) in winter, and this statement led me to suppose that we would come across it in numbers. On the contrary, we found this form extremely scarce, securing only four specimens, all females, which could be positively identified as such, and three or four others which appeared to be between *townsendi* and *fuliginosa*. Of the four identified as *townsendi*, two were taken at Capetown, right on the coast; one near Petrolia, a little farther inland; and one at Thorn. Possibly the Townsend Fox Sparrow appears in Humboldt County in greater numbers later on in the winter, lagging behind the other species during the fall migration, or perhaps waiting until heavy storms or lack of food actually force an exodus from its breeding grounds.

Of the thirty-eight specimens taken, only the four mentioned above could be decidedly separated from *fuliginosa*; and but one or two even tend toward the lighter colored, more grayish, yet slender billed races found during the fall migration east of the humid coast belt, and these few cases are not very pronounced.

Representatives of what Swarth terms the "Schistacea group", with the gray or brownish coloration predominating, and a much more stubby bill, among which are the so-called "slate-colored" and "thick-billed" sparrows, were entirely absent from the territory we worked in, although careful watch was maintained for strays of those races. Nor was the "Iliaea group", of bright reddish and clear gray coloration approaching the eastern fox sparrow, met with in a single instance.

This seems to show that while the darker races select the coast territory for the line of flight, some do stray toward the interior, and that no individuals of the other two groups are attracted toward the coast until fairly well south, say, to Sonoma or Marin County.

While the work above outlined has not been sufficiently systematic or long continued to obtain the amount of information upon the subject which it would be desirable to have, it has been sufficiently so to give a good idea of the conditions in the territory covered. With similar fall work in sections farther eastward, which it is hoped will be accomplished in the near future, a good deal more will be added to our meager store of knowledge concerning these groups, and a good working basis established for more detailed operations. It is with the hope of stimulating more widely spread interest in this matter, as much as to give the public the benefit of such observations as it has been in my power to make, that these papers upon fox sparrows are submitted.

*San Francisco, California, January 6, 1922.*